



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/585,432

07/07/2006

Kazue Shirota

215384-106296

4686

44200

7590

11/03/2009

HONIGMAN MILLER SCHWARTZ & COHN LLP
38500 WOODWARD AVENUE
SUITE 100
BLOOMFIELD HILLS, MI 48304-5048

EXAMINER

FIDLER, SHELBY LEE

ART UNIT

PAPER NUMBER

2861

MAIL DATE

DELIVERY MODE

11/03/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/585,432	Applicant(s) SHIROTA ET AL.	
	Examiner SHELBY FIDLER	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/8/2009</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Responsive Office Action

This Office Action is responsive to Applicant's remarks and amendments filed 6/29/2009.

Information Disclosure Statement

The information disclosure statement (IDS) submitted on 10/8/2009 was filed after the mailing date of the non-final Office Action on 4/1/2009. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

While Examiner appreciates that the "reduction of life gap" is not the only intended purpose of the invention, the current title of the invention still seems too broad since the title purports that Applicant has invented the inkjet printer itself and a method of printing.

Claim Objections

Claim 11 recites the limitation "the printing ink step" (line 16 of the claim). There is insufficient antecedent basis for this limitation in the claim.

Claim 16 is objected to because of the following informalities: please change the first recitation of "nozzles" (line 2 of the claim) to "nozzle," so as to place the claim in proper sentence format. Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-6, 8, and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

These claims have been examined as best understood.

Regarding claims 1-6 and 11:

The currently amended claims include multiple limitations that use the phrase "means for" or "step for", but it is modified by some structure, material, or acts recited in the claim. For example, claim 1 states that the inkjet printer comprises a head carrier control circuit that provides means for driving the print head. According to the instant specification, it is the head carrier control circuit itself that is performing the driving of the print head. Therefore, it is unclear whether the recited structure, material, or acts are sufficient for performing the claimed function which would preclude application of 35

Art Unit: 2861

U.S.C. 112, sixth paragraph, because Examiner cannot determine whether the claim scope encompasses only the structure, or if it encompasses both the structure and its functional equivalents.

If applicant wishes to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant is required to amend the claim so that the phrase "means for" or "step for" is clearly **not** modified by sufficient structure, material, or acts for performing the claimed function.

If applicant does **not** wish to have the claim limitation treated under 35 U.S.C. 112, sixth paragraph, applicant is required to amend the claim so that it will clearly not be a means (or step) plus function limitation (e.g., deleting the phrase "means for" or "step for").

Regarding claim 8:

This claim states that the step of moving the print medium includes: "moving the head carrier . . . and utilizing a head carrier control circuit for moving the head carrier." Because both of these steps are concerned with moving the head carrier, and not the print medium, it is confusing how this claim further limits the print medium moving step. Further, assuming these steps do correspond to the step of moving the print medium, Examiner has not been able to identify the portions of the specification that teach these steps.

Regarding claim 12:

It is not clear to what this claim is directed. The claim reads "A for print method that utilizes a print head . . ." Because of amendments to the claim, Examiner is not

Art Unit: 2861

sure whether this claim is meant to be directed to a computer program or a printing method. If the body of the claim is meant to limit the functionality of a computer program, please note that the claim must be directed to a computer readable medium containing the program to meet the requirements set forth by 35 USC 101.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1-3, 7-9, and 11-19, are rejected under 35 U.S.C. 102(b) as being anticipated by US 5483268 to Fujimoto (hereinafter “Fujimoto”).

Regarding claim 1:

Fujimoto discloses an inkjet printer for printing ink onto a print medium, the inkjet printer comprising:

a head carrier (carriage 27) detachably-mounted to a print head (1) that has a plurality of ink nozzles (2);

a head carrier control circuit (inherent to movement of carriage 27) communicatively coupled to the head carrier (col. 5, lines 30-33), wherein the head carrier control circuit drives the print head in a shift direction that is substantially perpendicular to a feeding direction of the print medium (col. 5, lines 30-33); and

a print head control circuit ("circuit of the print head") communicatively coupled to the print head (col. 5, lines 7-10), wherein the print head control circuit prevents one or more of the plurality of ink nozzles from becoming clogged by:

Art Unit: 2861

selectively utilizing a first portion of the plurality of ink nozzles (nozzles E-L) for printing the ink on the print medium (col. 3, lines 15-27),

moving the print head in the shift direction that is substantially perpendicular to the feeding direction of the print medium (col. 3, lines 19-22), and

selectively utilizing a second portion of the plurality of ink nozzles (nozzles D-K) that is different from the first portion of the plurality of ink nozzles for printing the ink on the print medium (col. 3, lines 34-36).

Regarding claim 2:

Fujimoto discloses all the limitations of claim 1, and also that the print head control circuit controls printing of the ink on the print medium with the first portion of the plurality of ink nozzles (nozzles E-L) when the print head is in a first fixed position relative the print medium (the position that prints the first dots in the first line - col. 3, lines 15-22 & Fig. 1),

wherein the head carrier control circuit controls movement of the head carrier in the shift direction that is substantially perpendicular to the feeding direction of the print medium after the print head had printed the ink on the print medium a predetermined number of times (col. 3, lines 19-22), and

wherein the print head control circuit further controls printing of the ink on the print medium with the second portion of the plurality of ink nozzles (nozzles D-K) when the print head is in a second fixed position relative the print medium (the position that prints the first dots in the second line – col. 3, lines 31-36 & Fig. 1), wherein the second fixed position is different from the first fixed position (Fig. 1).

Art Unit: 2861

Regarding claim 3:

Fujimoto discloses all the limitations of claim 1, and also that the head carrier control circuit selectively controls movement of the head carrier relative the print medium such that one of the first and second portions of the plurality of ink nozzles may selectively dispose a plurality of character strings substantially arranged in a column that is defined by the ink onto the print medium as the print medium is moved in the feeding direction (Fig. 1).

Regarding claims 7 and 12:

Fujimoto discloses a method for operating an inkjet printer including a head carrier (carriage 27) detachably mounted to a print head (1) having a plurality of ink nozzles (2) that print ink onto a print medium, the method comprising the steps of:

printing ink on a print target area width (print width a) of the print medium (col. 3, lines 15-25), wherein the print target area width of the print medium is less than a maximum print width of the print head (Fig. 1),

wherein the printing ink step includes:

using a first predetermined portion of ink nozzles of the plurality of ink nozzles (nozzles E-L), wherein the first predetermined portion of ink nozzles defines a first selected print width of the print head that is less than the maximum print width of the print head (Fig. 1), wherein the first selected print width is substantially the same as the print target area width of the print medium (Fig. 1);

ceasing the printing ink step (col. 3, lines 27-30);

Art Unit: 2861

moving the print medium in a feeding direction relative the head carrier (col. 3, lines 31-34);

moving the head carrier in a direction substantially perpendicular to the feeding direction of the print medium (col. 3, lines 31-34); and

using a second predetermined portion of ink nozzles of the plurality of ink nozzles (nozzles D-K) that are different from the first predetermined portion of ink nozzles for further printing ink on the print target area width (col. 3, lines 34-36), wherein the second predetermined portion of ink nozzles defines a second selected print width of the print head (Fig. 1), wherein the second selected print width is substantially the same as the print target area width of the print medium (Fig. 1).

Regarding claim 8:

Fujimoto discloses all the limitations of claim 7, and also that the moving of the head carrier step includes:

moving the head carrier by a predetermined pitch as the print medium is fixed (col. 3, lines 14-30 & Fig. 1); and

utilizing a head carrier control circuit (inherent to movement of carriage 27) for moving the head carrier in the direction substantially perpendicular to the feeding direction of the print medium (col. 3, lines 14-30).

Regarding claim 9:

Fujimoto discloses all the limitations of claim 7, and also that the step of moving the head carrier is conducted upon determining that the printing ink step has been performed a predetermined number of times (col. 3, lines 15-22).

Art Unit: 2861

Regarding claim 11:

Fujimoto discloses an inkjet printer for printing ink onto a print medium, the inkjet printer comprising:

a print head (1) having a plurality of ink nozzles (2) and;

a print head control circuit ("circuit of the print head") communicatively coupled to the print head (col. 5, lines 7-10), wherein the print head control circuit improves the life of the print head by preventing one or more of the plurality of nozzles from becoming clogged by:

using a first predetermined portion of ink nozzles of the plurality of ink nozzles (nozzles E-L), wherein the first predetermined portion of ink nozzles defines a first selected print width of the print head that is less than the maximum print width of the print head (Fig. 1), wherein the first selected print width is substantially the same as the print target area width of the print medium (Fig. 1);

ceasing the printing of ink (col. 3, lines 27-30);

moving the print medium in a feeding direction relative the print head (col. 3, lines 31-34);

moving the print head in a direction substantially perpendicular to the feeding direction of the print medium (col. 3, lines 31-34); and

after moving the print head, using a second predetermined portion of ink nozzles of the plurality of ink nozzles (nozzles D-K) that are different from the first predetermined portion of ink nozzles for further printing ink on the print target area width (col. 3, lines 34-36), wherein the second predetermined portion of ink nozzles defines a

Art Unit: 2861

second selected print width of the print head (Fig. 1), wherein the second selected print width is substantially the same as the print target area width of the print medium (Fig. 1).

Regarding claim 13:

Fujimoto discloses a printing method that utilizes a print head (1) having a plurality of ink nozzles (2) for ejecting ink onto a print medium, wherein the plurality of ink nozzles defines a maximum print width of the print head (Fig. 1), wherein the print medium includes a print target width (print width a) that is less than the maximum print target width of the print head (Fig. 1), the method comprising the steps of:

locating the print head at a first location (the position shown in Fig. 1) relative the print medium such that one or more first ink nozzles (nozzles I-L) of the plurality of ink nozzles are located within the print target width of the print medium (col. 3, lines 15-27 & Fig. 1); and one or more second ink nozzles (nozzles A-D) of the plurality of ink nozzles are located outside of the print target width of the print medium (Fig. 1),

wherein the one ore more first ink nozzles are positioned with a potential for ejecting the ink from the print head onto the print medium (Fig. 1), wherein the one or more second ink nozzles are not positioned with the potential for ejecting the ink from the print head onto the print medium (Fig. 1); and

moving the print head from the first location to a second location that is different from the first location (the position described in col. 3, lines 27-30) such that one or more second ink nozzles are moved from being outside of the print target width to being within the print target width such that one or more second ink nozzles moved within the

Art Unit: 2861

print target width are positioned with the potential for ejecting the ink from the print head onto the print medium (col. 3, lines 27-36 & Fig. 1).

Regarding claim 14:

Fujimoto discloses all the limitations of claim 13, and also that any of the one or more first and second ink nozzles that are located within the print target width are utilized for printing the ink onto the print medium (Fig. 1).

Regarding claim 15:

Fujimoto discloses all the limitations of claim 14, and also that the method comprises the step of ceasing the printing step (col. 3, lines 27-31), wherein the moving, printing, and ceasing steps are repeated for equally utilizing each ink nozzles of the plurality of ink nozzles (Fig. 1).

Regarding claim 16:

Fujimoto discloses all the limitations of claim 15, and also that the repeated moving step results in each ink nozzle of the plurality of ink nozzles being moved from outside of, to within the print target width on a substantially equal basis such that each ink nozzle of the plurality of ink nozzles is utilized substantially equally (Fig. 1).

Regarding claims 17-19:

Fujimoto discloses all the limitations of claim 15, and also that the repeated moving step results in improving the life of the print head, reducing ink ejection troubles of the print head, and reducing the likelihood that one or more of the plurality of ink nozzles become clogged by preventing one or more of the plurality of ink nozzles from being infrequently utilized (Fig. 1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 5483268 to Fujimoto (hereinafter "Fujimoto").

Regarding claim 4:

Fujimoto discloses all the limitations of claim 1, and also discloses that the print head control circuit selectively controls ejection of the ink from the plurality of nozzles (col. 3, lines 22-25 – "according to print information") and selectively controls which ink nozzles of the plurality of ink nozzles should be used for printing the ink on the print medium such that one or more of the first and second portions of the plurality of ink nozzles are selected for use (col. 3, lines 14-40 & Fig. 1).

Fujimoto does not expressly disclose that the print head control circuit comprises a buffer.

However, Examiner takes Official Notice that it is well known in the art to utilize print buffer memories for the purpose of configuring the input print data for printing with the print head.

Art Unit: 2861

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize a print buffer into the print head control circuit of Fujimoto's inkjet printer.

Claims 5 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5483268 to Fujimoto (hereinafter "Fujimoto") in view of US 2005/0035989 to Arakawa et al. (hereinafter "Arakawa").

Regarding claim 5:

Fujimoto discloses all the limitations of claim 1, and also discloses that a central processing unit is communicatively coupled to one or more of the head carrier control circuit and the print head control circuit (inherent to the timing of control pulses shown in Fig. 2).

Fujimoto does not expressly disclose that the inkjet printer comprises a sensor and encoder.

However, Arakawa discloses an inkjet printer comprising a sensor (19) and an encoder (20) that are communicatively coupled to a central processing unit (Fig. 2), wherein the sensor detects the position of the print medium by detecting a mark (M) that is provided on the print medium at predetermined intervals in the feeding direction (paragraph 111 & Fig. 3). Arakawa teaches that the sensor and encoder act together to provide improved reliability in detecting recording medium feed precision (paragraphs 7, 19).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to incorporate a sensor and encoder, such as those disclosed by Arakawa, into Fujimoto's inkjet printer.

Regarding claim 10:

Fujimoto discloses all the limitations of claim 7, **but does not expressly disclose** the step of detecting a relative position of the print medium.

However, Arakawa discloses the step of detecting a relative position of the print medium by utilizing a sensor (19) and an encoder (20) to detect at least one mark (M) on the print medium as the print medium is moved in the feeding direction (Fig. 6) for determining an amount of the print medium being fed in the feeding direction (paragraph 118). Arakawa teaches that the sensor and encoder act together to provide improved reliability in detecting recording medium feed precision (paragraphs 7, 19).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to incorporate a sensor and encoder, such as those disclosed by Arakawa, into Fujimoto's inkjet printer.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fujimoto as modified by Arakawa, as applied to claim 5 above, and further in view of EP 1334836 A1 to Fisher et al. (hereinafter "Fisher").

Regarding claim 6:

Fujimoto's modified inkjet printer comprises all the limitations of claim 5, but neither Fujimoto nor Arakawa expressly disclose that the encoder comprises a slave roller.

However, Fisher discloses a printer comprising an encoder (100) that detects an angle of rotation of a slave roller (130) which rotates while keeping contact with a surface of a print medium (abstract & Fig. 7).

Therefore, at the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize the encoder disclosed by Fisher into Fujimoto's modified inkjet printer. Motivation for doing so, as provided by Fisher, is so that the timing of printing is determined upon the actual position of the print medium itself (abstract).

Response to Arguments

Applicant's arguments filed 6/29/2009 have been fully considered but they are not persuasive.

Applicant states that Fujimoto "teaches away from the claimed invention by permitting operation of the print head when nozzles become clogged" (page 13 of remarks). Examiner respectfully disagrees. As stated by Applicant, Fujimoto discloses that clogged nozzles may still be used during printing. Further Fujimoto does not expressly disclose that the disclosed method of printing prevents the nozzles from becoming clogged. However, merely because Fujimoto does not disclose all the advantages of the disclosed printing method does not preclude Fujimoto's method from having those advantages. In much the same way as Applicant's invention, Fujimoto

Art Unit: 2861

provides a plurality of nozzles that are shifted in the main scanning direction during a printing operation. Because none of the plurality of nozzles remain dormant during the entire course of a printing operation, each of the nozzles are given the opportunity to spit ink, thus preventing them from becoming clogged. Therefore, Fujimoto does disclose all the limitations of independent claims 1 and 11.

Applicant also states that, in Fujimoto, the width of the target area over which printing is performed is thirty-two dots (i.e. the number of dots corresponding to "AAAA" through "HHHH"). Thus, Applicant feels that Fujimoto's target area is wider than the substantial width of the nozzles (page 16 of remarks). Examiner respectfully disagrees. The diagram in Figure 1 of Fujimoto merely discloses the position at which each of the plurality of nozzles are able to print in a given print line. Please note that, in any given print line, only a portion of the nozzles are actually used (as exemplified in col. 3, lines 34-36). Therefore, Fujimoto does disclose that the selected print width of the print head is much less than the maximum width of the print head, as required by claims 7, 11, and 12.

Regarding Applicant's additional arguments regarding claim 12-19, they do not appear to comply with 37 CFR 1.111(c) because they do not clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. Further, they do not show how the amendments avoid such references or objections.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SHELBY FIDLER whose telephone number is (571)272-8455. The examiner can normally be reached on M-F 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2861

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW LUU/
Supervisory Patent Examiner, Art
Unit 2861

/Shelby Fidler/
Examiner, Art Unit 2861